227 The Traveling Patient

JONAS A. SHULMAN and ALLAN MORRISON, JR.

Developments of the post–World War II era including the advent of diverse modes of rapid transportation, enhanced complexity of relations between nations, and significant population mobility have contributed to greatly increased international travel. With this phenomenon, the role of the clinician has come to include the practice of emporiatrics (from the Greek *emporos,* 'one who goes on shipboard as a passenger' and *iatrike,* 'medicine'). Because travelers are at risk for acquiring certain illnesses, the modern physician's responsibilities now encompass pretravel assessment of baseline medical health risk (preferably 1 to 2 months before planned departure), recommendations for the prevention of diseases that may be endemic or epidemic in the area to be visited, and therapy for symptoms that develop during travel. Posttravel follow-up is also indicated to diagnose and treat clinically evident or occult infection. Continuity of health care delivery is the cornerstone to effective management of the traveling patient.

Particularly important components of the history in a patient requesting travel health counseling include the exact travel itinerary and duration of stay in each country. Previous illnesses, allergies, medications, pregnancy, and detailed vaccination history must be carefully documented.

Pretravel Education

Health care recommendations for travelers must be specifically tailored to the individual, since each traveler has a different underlying medical status. These recommendations should be made in a manner that apprises the traveler of the risks involved but does not instill undue anxiety. To recommend appropriate protection against illness and to assist patients once they become ill, the physician must obtain a careful baseline history and physical examination. Travelers should be provided with an appropriate summary of these findings and a list of their current medications, both of which should be taken on the trip in case a medical problem develops. Female travelers must be asked about possible current pregnancy or pregnancy plans, since pregnant patients need to avoid many of the drugs or immunizations that are prescribed for some travelers, such as certain antimalarial or live vaccines.

Travelers with known drug and/or food sensitivity should obtain medical alert bracelets that specify the allergy, and travelers with significant underlying disease should be given a list of physician specialists in the areas of travel to facilitate prompt evaluation in case of an emergency. Individuals who wear glasses or contact lenses should be advised to obtain a copy of their prescription and to take an additional set of lenses with them in case of damage or loss. They should also take an adequate supply of prescription medications, since these may be difficult to obtain while away. In case additional medications may be needed in an emergency, a labeled prescription utilizing the generic as well as trade name of the drug may prove useful. The traveler should be advised that certain drugs obtained outside the United States may not be subject to the same standards of quality control. In some countries many drugs are available "over-the-counter" without a prescription, and the pharmacologic potency can be quite variable.

Other concerns that should be addressed will depend on the locale of the planned travel. Knowledge of the hazards of insect bites, the proper use of insect repellents and mosquito netting, and the need to avoid using perfume and aftershave lotions may prove beneficial in settings where malaria, dengue, and other arthropod-borne illnesses are common. Travelers should be aware that remaining indoors after dark and wearing clothing that covers the arms and legs will help protect against insect bites. In addition, swimming in fresh water should be avoided entirely, especially in areas of the world where schistosomiasis is found. Warnings regarding the hazards of unprotected sexual contacts are particularly important, especially if the traveler is going to an area of high endemicity for sexually transmitted diseases such as human immunodeficiency virus (HIV), hepatitis B, or antimicrobial-resistant gonococci.

Supplying travelers with guidelines for the prevention of diarrhea is most important. Unpasteurized milk or milk products, inadequately cooked meat or fish, raw salads, and unpeeled fruits should be avoided in most areas of the developing world. When water purity is questionable, the water must be avoided entirely unless it is first adequately boiled, treated with iodine compounds (preferable to chlorine compounds), or filtered with one of the newer filtration systems available in most camping equipment stores. Travelers should be advised to drink bottled carbonated or canned drinks, tea or coffee made with boiling water, or beer or wine. No ice cubes made from unpurified water should be used.

Depending upon the mode of travel or planned terrain conditions, travelers may benefit from a carefully planned medical kit. Items that should be considered for inclusion are a thermometer, aspirin or acetaminophen tablets, sterile dressings, adhesive tape, an anti-motion-sickness preparation, loperamide for cramps or debilitating diarrhea, an antacid, an antibiotic-antifungal skin ointment, a mild sedative for use after major time zone changes, insect repellent containing DEET, flying insect spray, and a sunscreen lotion. Antibiotics such as ciprofloxacin or trimethoprim-sulfamethoxazole may be included since they are useful if severe diarrhea occurs, especially when fever and/or bloody mucus is also present. For travel to areas where diarrhea is common, a supply of premixed oral solutions with appropriate amounts of glucose and electrolytes is likely to be beneficial. Clearly, avoidance of excessive alcohol and central nervous system depressants and/or stimulants will help the traveler adjust to circadial phenomena that occur during time zone shifts. Provision of malaria prophylaxis is essential if traveling to an endemic region.

Travelers with significant pulmonary insufficiency should

be informed that supplemental oxygen is recommended when flying above an altitude of 22,500 feet. Travelers with serious cardiovascular or peripheral vascular disease may also require supplemental oxygen. Since modern jets cruise at altitudes exceeding this limit, commercial airlines will provide supplemental oxygen if notified a minimum of 48 hours in advance of flight and furnished with a written statement of need from the traveler's physician. Patients whose pulmonary function testing demonstrates a measured vital capacity below 50% of the predicted normal value should avoid air travel altogether.

Special attention to adequate movement and exercise is indicated during lengthy flights. Wearing support hose may be beneficial, and occasional standing or walking in the aisles (as permitted) during the flight will help prevent venous stasis thrombosis or even pulmonary embolus. Special meals (e.g., low sodium or low cholesterol diets) can be arranged if the airline is given adequate advance notice.

The widespread concern about HIV infection has led some countries to require evidence of negative HIV serology prior to entry into their borders. An up-to-date list of countries requiring this test can be obtained from the Centers for Disease Control (CDC) or a local health clinic devoted to travel medicine. Similarly, individuals traveling to areas of the world where a significant portion of the population is infected with HIV should be instructed to avoid unprotected sex with the native population. Blood or blood product transfusion should be avoided except when these substances are absolutely required as life saving measures. Unsterilized needles must never be used.

It is important that travelers be warned that automobile trips over local roads, especially in developing countries, may be quite dangerous. Great care must be taken to prevent motor vehicle accidents, which are among the most serious of all travel-related problems.

Table 227.1
Regions Where Certain Infectious Diseases Are Endemic[a]

Malaria
Areas where anopheles mosquitoes and humans with plasmodia gametocytes co-exist (many areas: Central and South America, Central and Southern Africa, southern parts of Middle East, Asia, and the South Pacific)

Chloroquine-resistant *P. falciparum*
Southern, eastern, and central Africa, southern and southeastern Asia, the South Pacific, parts of South America

Chloroquine and Fansidar-resistant *P. falciparum*
Areas of East Africa and Southeast Asia

Dengue
Most tropical and some subtropical areas where aedes mosquitoes flourish

Filariasis
Tropics and subtropics: Africa, Latin America, and the Indian subcontinent

Trypanosomiasis
African: East and west central Africa (middle third of the continent)
South American: Northern Mexico to southern Argentina

Schistosomiasis
Africa and Arabia, Middle East, South America, Caribbean, Japan, China, Philippines

Yellow fever
Areas in Africa and South America 15° north or south of the equator and other areas where the disease has spread such as portions of Central America and the Caribbean (must look up details of new areas of disease occurrence and immunization recommendations)

[a]See current references from the Centers for Disease Control for up-to-date changes in geographic location of these diseases

Immunizations

Decisions regarding immunizations for travelers are predicated upon an evaluation of the endemic and epidemic infections in the traveler's target locale (Tables 227.1, 227.2). Consequently, certain immunizations are *required* by some countries on arrival (only yellow fever and cholera currently fall into this category), while other immunizations are required *only under specific circumstances.* Most immunizations are not required but may be recommended for all travelers; others should be recommended only for persons at high risk. Vaccinations that are no longer recommended for travelers include smallpox and the bacillus Calmette-Guérin (BCG).

In general, travel to Western European countries, New Zealand, Australia, Japan, and Canada constitutes no greater risk than travel within the continental United States. Conversely, travel to less socioeconomically developed nations constitutes an increased risk for the acquisition of many preventable infections, particularly poliomyelitis, hepatitis, diphtheria, measles, mumps, and rubella. Recommendations must be individualized, but general guidelines are published yearly in *Health Information for International Travelers,* which can be obtained from the United States Public Health Service. This publication allows the physician to be able to make "up-to-date" recommendations of vaccines for travelers. In females who are pregnant or who are planning to become pregnant in the immediate future, potential contraindications for immunization and other prophylactic medications must also be considered. In this era of the acquired immunodeficiency syndrome (AIDS), individuals who have been at high risk for HIV infection may need HIV serology and further clinical assessment before vaccines are administered, since immunization of even healthy HIV-infected patients (although considered by many to be safe) may theoretically present some risk. Progressive infection with live, attenuated viruses may occur in these HIV-infected patients and may therefore be especially dangerous in patients with AIDS or other immunocompromised states.

Vaccines for Specific Infections

The risk of *poliomyelitis* in the unprotected traveler mandates that the physician review the patient's vaccination status. Two types of polio vaccine are available in the United States: inactivated poliovirus vaccine (IPV), which is now being replaced by an enhanced form of IPV known as eIPV, and live attenuated oral poliovirus vaccine (OPV). Adults who have previously completed a full course of primary vaccination with OPV may receive a booster dose of oral polio vaccine, or a dose of eIPV as an alternative possibility, before departing for areas where poliomyelitis is endemic or epidemic. Adult travelers who have not received a primary vaccination series should be immunized with eIPV, since these adult travelers have a slightly increased risk of developing paralysis when given oral polio vaccine (estimated to occur at a rate of approximately one case per 9 million doses). Oral polio vaccine should not be given to patients

Table 227.2
Prevention of Selected Infections During Travel[a]

Infection	Means of prevention	Region visited
Dengue, malaria, filariasis	Mosquito control; repellents, remaining indoors at night, insect netting during sleep	Endemic areas during mosquito season
Diarrhea	Consumption of peeled citrus fruit, bottled liquids, bread, other food if served steaming hot; prophylaxis for selected travelers may include either bismuth subsalicylate or antimicrobial agents (see text)	Asia, Africa, Latin America
Hepatitis A	Immune serum globulin	Dose and frequency depend on length of travel to highly endemic areas
Hepatitis B	Consider primary course of vaccine if nonimmune	Travel to developing regions known to have a high incidence of hepatitis B (including China); also for health care workers in developing areas
Malaria	Chloroquine weekly, continued 4 to 6 weeks after returning home; reduce contact with mosquitoes (well-screened areas, mosquito nets, clothes covering body, insect repellent containing DEET)	All areas of malaria endemicity except where chloroquine-resistant *P. falciparum* exists
While in endemic areas with no chloroquine resistance	Begin chloroquine 2 weeks before travel and take once weekly throughout travel. Continue 6 weeks after returning home; reduce contact with mosquitoes (well-screened areas, mosquito nets, clothes covering body, insect repellent containing DEET)	All areas of malaria endemicity
While in endemic areas with chloroquine resistance	For SHORT-TERM TRAVEL (up to 3 weeks) chloroquine weekly; treat febrile illnesses with 75 mg pyrimethamine + 1500 mg sulfadoxine (Fansidar) as single dose (p.o.) and seek medical attention; for LONG-TERM TRAVEL, chloroquine weekly + 25 mg pyrimethamine and 500 mg sulfadoxine weekly; continue 4–6 weeks after return home (many recommend that Fansidar should not be used in this manner for prophylaxis and recommend chloroquine and doxycycline or chloroquine and proguanil; others suggest chloroquine and mefloquine. Use of these alternative agents is especially useful in areas where chloroquine and Fansidar resistance is present. Neither proguanil or mefloquine is available in the USA at this time. This is a rapidly changing field and up to date advice and consultation is required. The CDC can be called for help 24 hours/day at (404) 639-1610.	Areas where chloroquine-resistant P falciparum strains are endemic
Terminal, when leaving	In addition to chloroquine for 6 weeks give primaquine daily for 14 days after returning home (if patient is not G6PD deficient or pregnant).	Primaquine is helpful in terminal prophylaxis
Measles	Those born after 1956 who have not received oral vaccine nor had clinical disease should be vaccinated	Travel to developing regions
Schistosomiasis	Avoid swimming or bathing in fresh-water lakes and irrigation channels; chlorinated swimming pools are not known to be totally safe	Endemic areas
Tetanus-diphtheria	Vaccine booster every 10 years	All travelers
Trichinosis, tape worms, flukes, and *Vibrio* species	Avoid ingestion of raw or undercooked fish, pork, sausage, beef, bear meat	All areas
Trypanosomiasis		
African	Wear long sleeves and trousers, avoid brightly colored clothing, use mosquito nets	East Africa, northern Botswana (rural areas)
South American	Stay in well-constructed housing, use mosquito nets in insect-infested areas, use residual insecticides in homes in such areas	Central and South America (rural areas)

[a]More complete guidelines are available for illnesses not noted here and may be obtained from the Centers for Disease Control, the State or County Health Departments, local travelers' medical clinics, publications such as "Health Information for International Travel," biweekly "Blue Sheets" published by the CDC, and the "Morbidity and Mortality Weekly Reports" (MMWR) also published by the CDC. Since changes in requirements for vaccine administration or changes in the locale and epidemiology of these diseases occur frequently, accurate "up-to-date" information must be obtained from these primary sources.

who are significantly immunocompromised, whether from disease or drug treatment. In these situations, eIPV should be given instead. Although there are no compelling data to support the teratogenicity of polio vaccine, vaccination for nonimmunized pregnant women should be avoided unless the unvaccinated pregnant traveler will definitely be exposed to an epidemic situation.

A *tetanus* toxoid injection should be administered if more than ten years has elapsed since the last booster dose. The combined formulation Td (including tetanus toxoid and diphtheria toxoid) is recommended, since many adults lack circulating levels of protective antibodies against *diphtheria*, as well as tetanus. Nonimmunized patients require a full vaccine series.

Persons born prior to 1957 are assumed to be immune to *measles* virus, since measles was essentially universal before the measles vaccine became available. Persons born since 1957 should have documentation of having received live attenuated measles virus vaccine (given subcutaneously), since this vaccine is considered to provide longlasting immunity in more than 95% of vaccine recipients. Persons vaccinated during the period from 1963–1967 (up to one million United States citizens) may require revaccination, since those who received the killed measles vaccine may not be adequately protected. Unfortunately, killed measles vaccine lacks the enduring efficacy provided by the live attenuated measles vaccine.

Immunity to *rubella* in women of childbearing ages should be established by serologic proof prior to international travel, since the risk of infection is considerably greater in those countries where widespread rubella vaccination has not occurred. Remember that *live measles and rubella vaccines should not be given during pregnancy, nor in individuals with immunodeficiency conditions.*

Yellow fever vaccine may be indicated and in some instances required for travel to some areas of tropical Africa and Central and South America where the disease is endemic. Because areas of the world where active infection exists change frequently, up-to-date information must be obtained directly from the CDC or its publications. A single injection of attenuated live yellow fever vaccine provides immunologic protection against this infection for ten years, beginning approximately ten days following immunization. Unfortunately, there is a significant rate (5 to 10%) of adverse reactions including headache, fever, and myalgias, but the vaccine is considered safe and effective. Since the vaccine strain is raised in chick embryos, persons with a hypersensitivity to egg products should not receive the yellow fever vaccine. Furthermore, the vaccine is contraindicated for infants less than one year of age, pregnant women (unless at extreme risk), and persons with a preexisting immunodeficiency state. A letter written by the traveler's physician stating why the vaccine is contraindicated may be required before crossing borders. Yellow fever vaccine recipients are required to have an International Certificate of Vaccination, which can only be issued by an official vaccine center. This document includes information regarding the vaccine origin, batch number, and the name of the individual administering the vaccine. Improper validation may result in a requirement for revaccination at the time of entry into the arrival country.

The use of the *cholera* inactivated bacterial vaccine is controversial. In general, cholera is an extremely rare occurrence in U.S. travelers to endemic or epidemic areas. Endemic areas include Asia, Northern Africa, and at times Southern Europe. Travelers with normal gastric acidity are considered to be at very low risk for developing disease due to *Vibrio cholerae*. The risk for infection is clearly higher in persons who take antacids or histamine receptor antagonists and in postgastrectomy patients.

The cholera vaccine has been shown to be protective in only 50% of vaccinated persons for a duration of three to six months, beginning six days after immunization. Some countries require International Certificates of Vaccination against cholera, and a single dose of vaccine fulfills international health regulations. Cholera vaccine is rarely recommended except for travel to the few specific countries that *require* vaccination for entry and for immunization of individuals who are considered to be at especially high risk.

Parenteral *typhoid* vaccine is available in the United States and is thought to be protective in approximately 70% of recipients; however, the vaccine usually is recommended *only* for persons traveling to areas where a substantial risk of exposure to typhoid is anticipated. Such areas where typhoid fever is common include many regions of Africa, Asia, and Central and South America. The primary immunization series consists of two injections administered 4 weeks apart. Boosters are required every 2 to 3 years. These recommendations could change if either the orally administered live vaccine under current study (strain Ty21a) or the intramuscular single dose of purified Vi capsular polysaccharide vaccine, both of which appear to be highly effective, become available.

For most adult travelers, prophylaxis against *hepatitis A* can be obtained by a single intramuscular injection of immune serum globulin, the dose depending upon the length of stay in the tropical or developing country. Passive immunization must be repeated approximately every 5 months, and the injection should be given as close as possible to the time of departure, since protection is mediated by antibodies which have a finite half-life. Pregnancy is *not* a contraindication to prophylaxis with immunoglobulin against hepatitis A.

The need for other immunizations (e.g., vaccines for hepatitis B, rabies, meningococcus, influenza) should be determined by the needs and plans of the individual traveler. *Hepatitis B* is highly endemic in many areas of the world, but there are currently no clear indications as to which travelers should be vaccinated. Nonetheless, hepatitis B vaccine may well be appropriate for persons traveling to populations where the prevalence of hepatitis B carriers is especially high (e.g., China, Indonesia, parts of the Caribbean, South Pacific, and Africa). If exposure to blood is likely, such as with health care workers, or if intimate sexual contact is anticipated with the resident population in an endemic region, hepatitis B vaccine may be an important prophylactic measure. In addition to the foregoing groups, travelers who plan extended stays of 6 months or longer in a country where the prevalence of hepatitis B carriage is especially high should be vaccinated. These areas of high prevalence currently include parts of Asia, Sub-Saharan Africa, and the interior Amazon basin.

Rabies vaccine is recommended only for (1) persons visiting or living for prolonged periods of time in countries where rabies is present and (2) those individuals who will have frequent contact with animals likely to be infected with rabies (e.g., trappers or anthropologists). Despite the low risk for most travelers, all should be informed about rabies, since animal rabies is endemic in many areas of Latin America, the Far East, and Africa. When exposure to rabies is thought to occur, health care must be sought promptly so that postexposure prophylaxis can be started if it appears

indicated. Children are particularly prone to rabies exposure and need to be wary of possible rabid animals.

Meningococcal vaccine rarely is required for U.S. travelers but should be given to those going to areas where epidemic meningococcal disease is occurring. Recently such areas have included Nepal, Saudi Arabia, Sub-Saharan Africa, the New Delhi region of India, and limited areas of South America. Inquiries for updated information from the CDC will help keep physicians abreast of indications for such vaccines.

Additional Important Considerations in Travel Medicine

Malaria

Malaria prophylaxis remains one of the most important albeit complex and confusing travel medicine issues for physicians. Malaria is present in many parts of the world and is caused by various species of Plasmodium via the bite of certain anopheles mosquitoes. The risk for malaria and the presence of chloroquine-resistant malaria is noted in *Health Information for International Travel.* The approach required is one that combines protection against the bite of mosquitoes, the use of safe and effective drugs for prophylaxis, and plans for medical care if malaria occurs. The choice of adequate prophylaxis is dependent upon the area of travel and, since no prophylactic regimen is 100% effective, even travelers who are taking appropriate prophylactic antimicrobials must be advised that prompt medical attention is required for any acute febrile illness that may be malaria.

Chemoprophylaxis for travel to areas endemic for chloroquine-sensitive *Plasmodium falciparum, Plasmodium ovale, Plasmodium vivax,* or *Plasmodium malariae* consists of weekly doses of oral chloroquine (300 mg base) beginning 1 week prior to departure and continuing for 6 weeks after return. Terminal prophylaxis with primaquine is sometimes prescribed to eradicate the hepatic phase of strains of malaria (*P. vivax* and *P. ovale*) in travelers who do *not* have glucose-6-phosphodiesterase deficiency and are *not* pregnant, since chloroquine has no effect on the hepatic phase.

In areas where travelers are at risk for acquiring chloroquine-resistant *P. falciparum,* there are several alternative suggestions for prophylaxis, the choices being continuously revised as efficacy and safety are evaluated. In general, a weekly dose of chloroquine (300 mg of base) is recommended, but a single dose of Fansidar (pyrimethamine and sulfadoxine) is also given to the traveler to use in the event that medical help is not immediately available and a febrile, flulike, possible malarial illness occurs. Fansidar has unfortunately been associated on rare occasions with fatal cutaneous reactions, such as the Stevens–Johnson syndrome (approximately 1 in 20,000 users). Travelers must be informed of this potential risk, therefore, if Fansidar is prescribed. (See Table 227.2 for more detail.)

A drug that may be effective in the treatment of chloroquine- and Fansidar-resistant malaria is mefloquine. Though not currently available in the United States, this drug is recommended by the World Health Organization for prophylaxis in East Africa and Southeast Asia and can be readily obtained in those areas of the world or in much of Europe. Weekly chloroquine and daily doxycycline are another regimen that has been suggested for travelers to rural regions of Southeast Asia and the Amazon region of South America, where confirmed chloroquine and/or Fansidar resistance has occurred.

Women who are pregnant or likely to become so should avoid travel to areas where chloroquine-resistant malaria is present and where prophylaxis with pyrimethamine/sulfadoxine (Fansidar) or some of the other newer regimens is needed. Chloroquine prophylaxis appears safe when used by pregnant women and is quite acceptable for prevention of chloroquine-sensitive malaria. Chloroquine does not provide complete protection against chloroquine-resistant falciparum malaria, however.

Consulting the CDC, the State Health Department, or an emporiatric specialist may be necessary in making some of the more complex travel medicine decisions, especially with the increase in chloroquine-resistant malaria and when multi-drug-resistant malaria organisms are known to be present in countries listed on the traveler's itinerary.

Some Important Protozoal Infections

Entamoeba histolytica can be an important cause of dysentery, other gastrointestinal symptoms, hepatic diseases, and occasionally a variety of other serious complications such as subdiaphragmatic infection, empyema, pericarditis, and peritonitis. Giardia and cryptosporidia are important enteric pathogens in travelers to many areas of the world and can be avoided to some degree by proper handling of food and water. Leishmania can cause infections in various parts of the world and is spread by sand fleas and flies. Visceral leishmaniasis can be acquired rapidly in India and occasionally in the Mediterranean area, East Africa, and South America. Cutaneous and mucocutaneous forms of the disease may also occur. Infection with leishmania can be partially prevented by taking measures to help decrease the incidence of insect bites.

Some Important Helminthic Infections

Prevention of schistosomal infections focuses on avoidance of swimming in unchlorinated fresh water in Africa, the Caribbean, Latin America, and the Far East. Strongyloides and hookworms are widespread soil inhabitants in tropical areas, and infection can be prevented by avoiding barefoot walking and by practicing other good hygienic measures.

Intestinal Infections

Diarrhea occurs in approximately 50% of persons traveling to high risk areas from industrialized regions. The most common cause of traveler's diarrhea in high risk areas is enterotoxigenic *Escherichia coli,* followed by strains of shigella, salmonella, campylobacter, and *E. coli* capable of producing disease by other mechanisms than enterotoxin production. Less common causes include giardia, cryptosporidia, and rotavirus. Amebiasis is a less common but potentially severe cause of gastrointestinal infection in travelers.

Individuals may experience illness either during their travels or soon after they return home. The severity of the diarrhea, the presence of blood or mucus in the stool, and the presence or absence of fever help to determine the most likely etiologies and, in turn, lead to the most helpful therapy. Febrile illnesses are more likely to be associated with invasive pathogens, as opposed to those that produce their effect primarily by enterotoxin formation. Diarrhea that is

short-lived is usually bacterial or viral, whereas a chronic disease course is more likely to be due to protozoal (e.g., amoebic, giardial, or cryptosporidial infection) or helminthic (e.g., coccidiosis, ascaris, or trichuria) infections or infestations. At times, a sprue-like illness or a disaccharidase deficiency may be present, producing diarrhea and malabsorption for some months even after the traveler has returned home.

The frequency of travelers' diarrhea can be diminished by selecting food and beverages carefully, especially when traveling to Latin America, Asia, or Africa. Items that usually are considered to be safe include peeled citrus fruit, any food served steaming hot, bread, or bottled beverages. Similar guidelines should be followed when eating meals prepared on commercial airlines that originate from such areas.

Bismuth subsalicylate (Pepto-Bismol) is effective in the prevention of travelers' diarrhea when taken in the appropriate dose and frequency. Patients who take this medication should be warned in advance of possible side effects such as black stools, which can be mistaken for melena. Generally speaking, the use of prophylactic antibiotics such as the quinolones should not be recommended for most tourists. Although prophylactic antibiotics are effective in approximately 80% to 90% of travelers, they are not usually recommended for most travelers, since the risks of antibiotic prophylaxis for prevention of diarrhea probably outweigh the benefits. In some travelers, however, antibiotic prophylaxis may be extremely helpful. Travelers going to high risk areas for less than two weeks who have an increased susceptibility to diarrhea (e.g., those with achlorhydria, a gastric resection, or hypoglobulinemia) who are receiving drugs like lithium, diuretics, or digitalis may benefit from prophylaxis. Similarly, patients on antacids or cimetidine-like drugs may have serious problems if they become dehydrated and thus are candidates for prophylactic antibiotics. A business traveler on a short trip who cannot "afford to spend time" in the restroom may also be a candidate for antibiotic prophylaxis.

If diarrhea does occur, it is nearly always self-limited. Careful attention to proper fluid and electrolyte replacement with a variety of balanced, sometimes premixed, oral, or, rarely, parenteral solutions is adequate for most situations. Any traveler who develops significant fever, chills, bloody stools, or in whom diarrhea persists for more than 3 days should be evaluated by a physician if possible. Oral ciprofloxacin is effective against the majority of the bacterial pathogens that have been isolated but is not effective in parasitic or viral gastroenteritis. Loperamide or other antimotility drugs may be effective in relieving severe abdominal discomfort and severe diarrhea but can prolong the illness caused by shigella and other invasive enteric pathogens. Therefore, antimotility drugs should be avoided if possible, especially if fever or bloody mucoid diarrhea is present.

Posttravel Assessment

Any decision regarding the evaluation of the returning traveler should be based upon the duration and location of travel and, of course, upon the clinical status of the traveler. The presence of fatigue is a normal concomitant of extensive travel and should not be viewed with alarm. Conversely, the presence of fever, chills, sweats, headaches, gastrointestinal symptoms, unexplained weight loss, cough, rash, or other complaints point to the need for medical evaluation. Persons who were ill during travel or who lived for a prolonged period of time in the developing world may need careful posttravel medical follow-up. In addition to details concerning the specific travel history and symptoms, physical examination must especially focus on the presence of skin rash, pulmonary signs, lymphadenopathy, hepatomegaly, and splenomegaly. No standard "battery" of laboratory tests has been developed that must be performed on all symptomatic returnees. Certain illnesses such as malaria, typhoid fever, hepatitis, amebiasis, and giardiasis have particularly prolonged incubation periods and can occur weeks or even months after return. Depending on the returning traveler's complaints and physical findings, some commonly preferred laboratory tests that may be indicated are a blood smear with complete blood count (checking for parasitemia, anemia, leukocytosis, or eosinophilia), liver tests (to detect evidence of hepatitis or parasitic infection such as a hepatic amebic abscess), urinalysis, and stool examination (checking for fecal leukocytes, bacterial pathogens, ova and parasites). A PPD and chest x-ray are indicated if exposure to tuberculosis was a likely possibility. A review of Tables 227.2 and 227.3 may be helpful in pointing to likely diseases and initial diagnostic studies. Further diagnostic and/or therapeutic intervention may require assistance from a specialist in infectious diseases or tropical medicine.

Table 227.3
The Returning Traveler Who Presents with Systemic Symptomatology of Systemic Illness: Criteria for Diagnosis of Some Selective Illnesses That Deserve Immediate Consideration

Condition	Laboratory diagnosis
Amoebic liver abscess	Elevated serologic tests + findings suggestive of hepatic abscess on scanning or surgical aspiration; stool for ova and parasites
Brucellosis	Recovery of the organism from blood or body tissue and/or serology with 4-fold or more rise or very high single convalescent titer
Dengue	Clinical suspicion, up to or more than 4-fold rise in antibody titers between acute- and convalescent-phase serum specimens; dengue virus can also be isolated from the acute-phase serum in special arbovirus laboratories
Filariasis	Detection and identification of microfilariae in blood or skin of the host
Leptospirosis	Specific serological studies showing a 4-fold or greater rise in titer or single very high convalescent titer or "positive" slide agglutination test result; culture of blood or specialized media (coordinate with laboratory)
Malaria	Detection of plasmodia on thick and/or thin blood smears
Trypanosomiasis	
African	Examination of lymph node aspirate or blood for motile trypanosomes and/or by serologic techniques
South American	Identification of motile parasites in blood smears, blood culture, and late in disease by serologic procedure
Typhoid fever	Recovery of *Salmonella typhi* from blood, bone marrow, "rose spots," or stool

Conclusion

The bibliography contains helpful references that may prove useful in treating the traveling patient. As more Americans travel, physicians in the United States need to become proficient in this area of medicine. Although serious diseases must be recognized and appropriately treated in patients who return from travel, there is even more gain to be realized through proper education and prevention of disease processes in the traveler.

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